

Math 2201
Chapter 4: Radicals

Midterm Review Questions 2015

1. Simplify each radical.

- a). $\sqrt{18}$ b). $\sqrt{384}$ c). $\sqrt{16}$ d). $\sqrt[3]{56}$
e). $\sqrt[3]{135}$ f). $\sqrt[3]{-16}$ g). $-2\sqrt{125}$ h). $3\sqrt{50}$

2. Write each mixed radical as an entire radical.

- a). $2\sqrt{5}$ b). $3\sqrt{15}$ c). $(-7)\sqrt[3]{4}$

3. Simplify.

- a). $3\sqrt{5x} + 2\sqrt{5x} + \sqrt{5x}$ b). $2\sqrt{6} + 3\sqrt{3} - 2\sqrt{27}$
c). $-2\sqrt{12} - 2\sqrt{8} - \sqrt{8}$ d). $2\sqrt{54} - 3\sqrt{24} + 3\sqrt{6}$
e). $-\sqrt{45x^3} + 2\sqrt{5x^3} + 2\sqrt{3x^4}$ f). $-3\sqrt{8} - 3\sqrt{8} - \sqrt{36} - 5\sqrt{2}$

4. Multiply. Simplify where possible.

Property #1:

- a). $\sqrt{3} \cdot \sqrt{2}$ b). $\sqrt{10} \cdot \sqrt{10}$ c). $\sqrt{3x} \cdot \sqrt{6x^3}$ d). $\sqrt{10} \cdot \sqrt{2}$

Property #2:

- e). $5\sqrt{2} \cdot \sqrt{6}$ f). $3\sqrt{8y} \cdot 2\sqrt{5y}$ g). $2\sqrt{18} \cdot 7\sqrt{20}$ h). $4\sqrt{12} \cdot 3\sqrt{27}$

Property #3:

- i). $\sqrt{2}(6 - 4\sqrt{2})$ j). $4x\sqrt{5}(4 + \sqrt{3x^6})$ k). $-2\sqrt{15}(\sqrt{5} + 3)$
l). $3\sqrt{3}(4\sqrt{3} - 2\sqrt{12})$ m). $5\sqrt{10}(-4\sqrt{6} + 3\sqrt{2})$ n). $-6\sqrt{5}(\sqrt{6} + \sqrt{2})$
o). $(3\sqrt{2} + \sqrt{3})(5\sqrt{2} + \sqrt{3})$ p). $(\sqrt{7} + 8\sqrt{6})(-3\sqrt{2} - 10\sqrt{3})$
q). $(\sqrt{5} + \sqrt{3})^2$ r). $(2\sqrt{3} - \sqrt{8})^2$

5. Divide. Simplify where possible.

Property #4 and Property #6:

a). $\frac{\sqrt{12}}{\sqrt{2}}$ b). $\frac{\sqrt{72}}{\sqrt{2}}$ c). $\frac{\sqrt{5}}{\sqrt{20}}$ d). $\frac{4\sqrt{25}}{5\sqrt{4}}$ e). $\frac{2\sqrt{6y^5}}{\sqrt{2y^2}}$

f). $\frac{4\sqrt{4}}{\sqrt{100}}$ g). $\frac{\sqrt{10x^3}}{6\sqrt{5x}}$ h). $\frac{12\sqrt{18}}{6\sqrt{2}}$ i). $\frac{15\sqrt{21}}{3\sqrt{3}}$ j). $\frac{18\sqrt{12}}{27\sqrt{6}}$

k). $\frac{3\sqrt{2} + \sqrt{3}}{\sqrt{5}}$ l). $\frac{\sqrt{243} + 15\sqrt{3}}{2\sqrt{7}}$ m). $\frac{3n^2 + \sqrt{2n}}{\sqrt{10n}}$

6. State restrictions and simplify.

a). $9x^2y\sqrt{40x^5y^6}$ b). $12xy^2\sqrt{48x^2y^3}$

7. Identify the restrictions on x for each expression.

a). $\sqrt{x+11}$ b). $\sqrt{6x}$ c). $\frac{7}{\sqrt{x-5}}$ d). $\frac{1}{\sqrt{2x+1}}$

8. For each equation: (i) State the restrictions.
(ii) Solve for the variable.
(iii) Verify the solution.

a). $\sqrt{2x+7} + 8 = 13$

b). $\sqrt{9y+10} - 6 = 2$

c). $\sqrt[3]{x-20} = -3$

d). $\sqrt{8+x} = -3$